

Claims

[001] A process for the production of a curved laminated glass pane (1) comprising a first glass sheet and a second corresponding glass sheet (2), together with an interlayer (3; 3') comprising at least one bioriented thermoplastic functional layer (5) and at least one layer of a bonding resin (4), such process comprising the steps of: thermoforming on a mould said at least one bioriented thermoplastic functional layer (5), together with at least one layer of a bonding resin (4) adhered to said at least one bioriented thermoplastic functional layer (5), in a configuration substantially corresponding to the end shape of said curved laminated glass pane (1); cooling by forced draught said at least one functional layer (5) and said suitable layers of a bonding resin (4), whereby the shape of said at least one functional film (5) is frozen; and positioning said interlayer (3, 3') between the two glass glazings (2) and applying pressure and heat to form a laminated glazing showing an end shape with one or more curvatures.

[002] A process according to claim 1 wherein, during the thermoforming step, a hot air jet is injected from the bottom so as to effect a pretensioning of said at least one functional layer (5).

[003] A process according to any of claims 1 to 2, wherein said interlayer (3) comprises two bonding resin layers (4), intended to be positioned into contact with distinct glass sheets (2), each adhered to the opposite side of one functional layer (5).

[004] A process according to claim 1, wherein said interlayer (3') comprises one functional layer (5), and a corresponding one bonding resin layer (4), adhered to one face of the functional layer, the functional layer (5) comprising, along its whole edge a pre-cut peripheral portion (5'), apt to be removed in a subsequent step.

[005] A process according to claim 1 or 4, wherein, before the thermoforming and the cooling steps, said interlayer (3') is cold-stamped in a configuration substantially corresponding to the end shape of the curved laminated glass pane to be manufactured.

[006] A process according to claim 4 or 5, wherein, in the thermoforming step, vacuum is applied to the interlayer (3') to make it adhere to the mould with the functional layer (5) adherent to the mould surface.

[007] A process according to one of the claims 4 to 6, wherein, in the positioning step, the shaped interlayer (3') is positioned over one glass glazing (2), with the bonding resin layer (4) applied to the glass surface.

[008] A process according to claim 7, wherein said one glass glazing (2) is intended to

be at the internal side of the final glass pane (1).

[009] A process according to claim 7 or 8, wherein said pre-cut portion (5') is peeled off when the interlayer (3') has been positioned over said one glass glazing (2), whereby the outer edge of the functional layer (5) remains to a certain distance from the edge of said one glazing (2).

[010] A process according to one of the claims 7 to 9, wherein, in the positioning step, a further bonding resin layer (4) is applied at least on the exposed functional layer (5) surface, and a second glass glazing (2) is positioned on it, the shape thereof perfectly matching with the shape of said one glazing (2) and of the interlayer (3') covered by said additional bonding resin layer (4).

[011] A process according to any of the preceding claims wherein said bonding resin is polyvinylbutyral (PVB).

[012] A process according to any of claims 1 to 4 characterised in that the glass pane is a curved glass pane having a cross curvature of at least 5.0 mm.

[013] A process according to any of claims 1 to 4 characterised in that the glass pane is a curved glass pane wherein at least a part of the curved surface has a radius of less than 10000 mm.

[014] A process according to any one of the preceding claims wherein said functional layer (4) comprises a film in polyethylene terephthalate (6) with one or more filtering (7) and/or reflecting (8) sub-layers adhered thereto.

[015] A process according to any one of the preceding claims wherein in the thermoforming the heating temperature is set at 130°C +/- 30°C.

[016] A process according to any one of the preceding claims wherein in the thermoforming there is employed a temperature detection system with use of an infrared pyrometer (16) with a wavelength sensor which detects the temperature rise of said at least one bioriented thermoplastic functional film (5) and said suitable layers of a bonding resin (4) and, as soon as the temperatures reaches the preset value, activates a system that interrupts the heating.